

**Preliminary Assessment
of
Peak Flow Storage Capacities
at
Selected Surface-Water Withdrawal
Points**

**Addendum for
Late Spring and Summer
Peak Flow Withdrawals**

**Prepared by the
Maine Geological Survey, Department of Conservation
for the
Maine Department of Environmental Protection**

November 2004

Introduction:

This report evaluates the volume of water available for withdrawal into storage during late spring and summer peak flow at six selected potential agricultural surface water withdrawal points, and compares it to proposed storage pond capacities obtained from water management plans submitted to the Department of Agriculture, Food and Rural Resources.

The basic methodology is described in the original report. This addendum only includes figures and a table showing the estimated volumes of water available during the periods May 15 to June 30 (late spring/early summer) and July 1 to September 15.

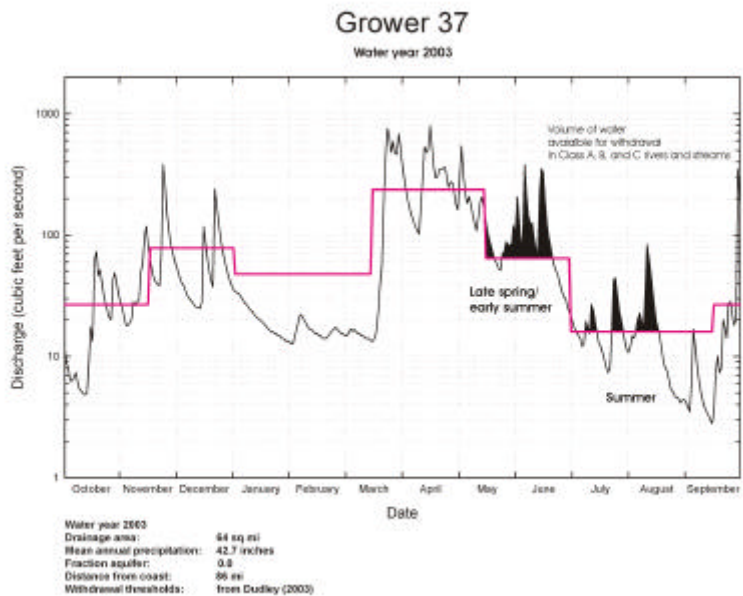
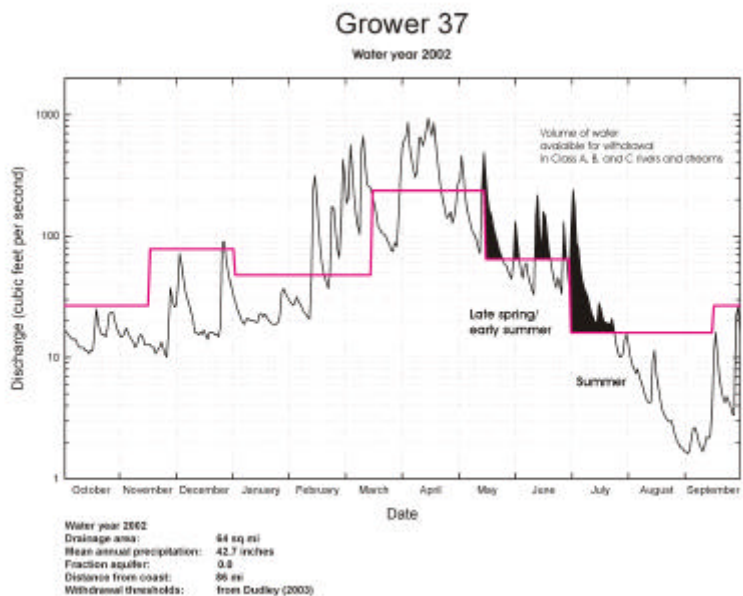
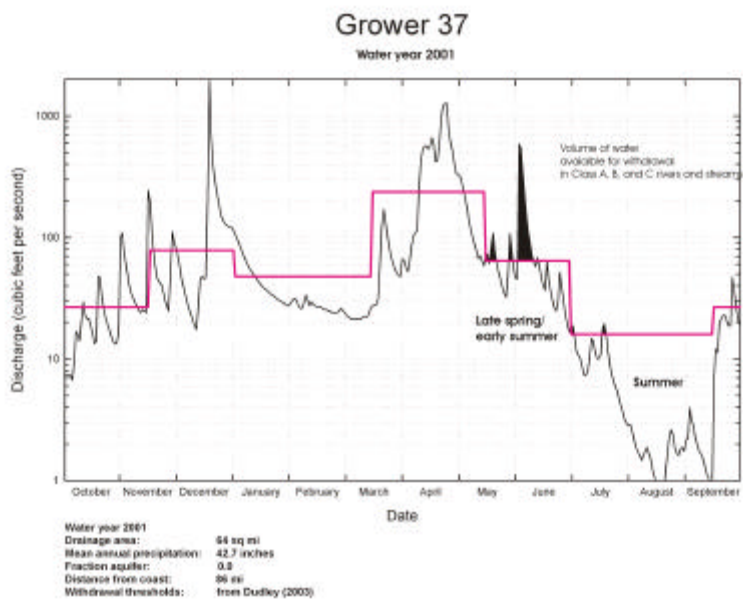
Methodology:

The late spring/early summer and summer seasonal withdrawal thresholds proposed in the internal working document prepared by the DEP in October 2004 were estimated for the six withdrawal points using the USGS regression equations for monthly median flow in Dudley, 2003. The proposed late spring/early summer seasonal withdrawal threshold is the estimated June median flow, and applies to the period May 16 to June 30. The proposed summer seasonal withdrawal threshold is the estimated August median flow, and applies to the period July 1 to September 15.

In the case of class A, B, and C rivers and streams, it is proposed that the entire excess flow above the proposed seasonal threshold would be available for withdrawal.

For class AA streams, it is proposed that only 10-percent of the seasonal threshold would be available for withdrawal and only when the flow is greater than 1.5 times the seasonal withdrawal threshold.

The figures on the next page graphically illustrate the volume of water available for withdrawal into storage during the spring runoff for Grower 37 (Piscataquis County) for water years 2001, 2002, and 2003.



Results:

The table below lists the six growers used in this assessment, their proposed storage pond capacities, and the excess stream flow volume above the proposed late spring/early summer seasonal withdrawal threshold for water years 2001, 2002, and 2003. Shaded boxes are water years when there is insufficient estimated flow above the proposed threshold to fill the holding pond during the late spring/early summer (May 15 to June 30).

Late spring/early summer – May 15 to June 30					
Grower	Drainage basin area (sq mi)	Proposed storage pond capacity (cfs)	Water year	Total excess flow (cfs)	
				Class A, B, C	Class AA
Grower 13	2.84	1.74x10 ⁶	2001	3.01x10 ⁶	0.20x10 ⁶
			2002	3.73x10 ⁶	0.27x10 ⁶
			2003	6.46x10 ⁶	0.43x10 ⁶
Grower 37	64	1.20x10 ⁶	2001	153x10 ⁶	4.45x10 ⁶
			2002	125x10 ⁶	7.79x10 ⁶
			2003	198x10 ⁶	10.0x10 ⁶
Grower 43	11	1.24x10 ⁶	2001	28.7x10 ⁶	0.83x10 ⁶
			2002	24.6x10 ⁶	1.34x10 ⁶
			2003	38.1x10 ⁶	2.01x10 ⁶
Grower 50	0.93	0.261x10 ⁶	2001	0.82x10 ⁶	0.07x10 ⁶
			2002	1.38x10 ⁶	0.06x10 ⁶
			2003	4.51x10 ⁶	0.21x10 ⁶
Grower 58-1	1.75	0.216x10 ⁶	2001	4.53x10 ⁶	0.14x10 ⁶
			2002	7.93x10 ⁶	0.36x10 ⁶
			2003	7.02x10 ⁶	0.36x10 ⁶
Grower 62	4.13	0.448x10 ⁶	2001	10.2x10 ⁶	0.32x10 ⁶
			2002	17.9x10 ⁶	0.91x10 ⁶
			2003	15.8x10 ⁶	0.88x10 ⁶

The table below lists the six growers used in this assessment, their proposed storage pond capacities, and the excess stream flow volume above the proposed summer seasonal withdrawal threshold for water years 2001, 2002, and 2003. . Shaded boxes are water years when there is insufficient estimated flow above the proposed threshold to fill the holding pond during the summer (July 1 to September 15).

Summer – July 1 to September 15					
Grower	Drainage basin area (sq mi)	Proposed storage pond capacity (cfs)	Water year	Total excess flow (cfs)	
				Class A, B, C	Class AA
Grower 13	2.84	1.74x10 ⁶	2001	1.97x10 ⁶	0.09x10 ⁶
			2002	9.07x10 ⁶	0.22x10 ⁶
			2003	7.78x10 ⁶	0.31x10 ⁶
Grower 37	64	1.20x10 ⁶	2001	0.85x10 ⁶	0
			2002	72.0x10 ⁶	1.80x10 ⁶
			2003	29.6x10 ⁶	1.52x10 ⁶
Grower 43	11	1.24x10 ⁶	2001	0.38x10 ⁶	0
			2002	13.3x10 ⁶	0.34x10 ⁶
			2003	6.34x10 ⁶	0.32x10 ⁶
Grower 50	0.93	0.261x10 ⁶	2001	0.28x10 ⁶	0.03x10 ⁶
			2002	0.61x10 ⁶	0.04x10 ⁶
			2003	0.50x10 ⁶	0.05x10 ⁶
Grower 58-1	1.75	0.216x10 ⁶	2001	1.47x10 ⁶	0.06x10 ⁶
			2002	0.60x10 ⁶	0.03 x10 ⁶
			2003	5.85x10 ⁶	0.13x10 ⁶
Grower 62	4.13	0.448x10 ⁶	2001	0.04x10 ⁶	0
			2002	0	0
			2003	5.41x10 ⁶	0.31x10 ⁶

Unlike the situation in the spring, there are periods in the late spring/early summer and summer seasons when there is inadequate water to fill the holding ponds. As would be expected, conditions are worst in the summer months if users are located on Class AA streams, but there were instances when even Class A, B, or C streams had inadequate estimated flows.

In the case of grower 62, there is a large percentage of sand and gravel in the basin. This produces a (relatively) large August median flow for the basin based on the Dudley (2003) regression equation. As a result, the proposed summer seasonal threshold in the basin is large relative to the estimated daily flows. The estimated daily flows are based on the USGS gage on Stony Brook at East Sebago, and both Grower 58-1 and Grower 62 have their estimated daily flows based on this gage. As a result of the higher proposed threshold, Grower 62 would be unable to withdraw water for much of the summer of 2001 and 2002 in spite of being located in a larger basin than Grower 58-1.

Summary:

As would be expected, there appear to be periods when there will be insufficient flow above the proposed seasonal withdrawal thresholds to fill holding ponds in the late spring/early summer and summer seasons. The worst cases will be on Class AA rivers and streams, where the withdrawal is proposed to be limited to no more than 10-percent of the threshold value when the flow is above 1.5 times the threshold, and is not some proportion of the flow above the threshold.

Also, the large uncertainty in the equations used to estimate the proposed thresholds, the use of Dudley's statewide regression equations for basins less than recommended 10 sq mi minimum size, and possible biases in estimating daily flows as ungaged withdrawal sites suggest that these results should be considered as general guidance only.